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Nine hundred fifty-six women Marines participated in a longitudinal study of knowledge, attitudes, and behaviors relevant to pregnancy and pregnancy attrition. The results indicated that many women are ambivalent about pregnancy when they enter the Marine Corps, and that as a group they become more family oriented, and more at risk of pregnancy throughout the early part of their first term. Between 18 and 25 percent of women Marines get pregnant in the first 12 months after recruit training. This relatively high pregnancy rate is the result of a combination of factors: (a) the women engage in sexual intercourse relatively frequently; (b) they do not choose effective methods of contraception; and (c) their attitudes toward pregnancy are not sufficiently negative to motivate conscientious and consistent use of their chosen methods of birth control.

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Antecedents of Pregnancy and Pregnancy Attrition in First Term Women Marines

Final Report ONR-89-1

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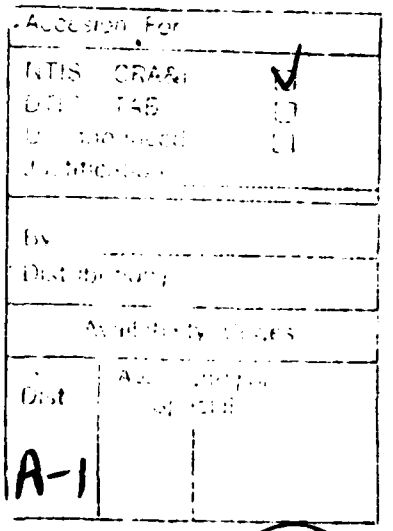
November 1, 1989



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INTRODUCTION

Statement of Problem

Given that young women generally join the Marine Corps at the start of their prime childbearing years, it is not surprising that many of them get pregnant during their first enlistment. And while exact data on the pregnancy rate among first term women Marines are not available (see Royle, 1983), analysis of the sexual behavior and contraceptive practices of this group suggests that approximately 20 percent of these women get pregnant each year (Gerrard & Royle, 1985). In fact, pregnancy attrition among first term women Marines over the last decade has varied from 16.6 percent and 21.3 percent for women who enlisted in FY 1977 and 1978 (Royle, 1983), to 13.5 and 15.3 percent in FY 1983 and 1984. A recent analysis suggests that the rate may be climbing.[1]

Pregnancy among first term women Marines presents at least two problems for the Corps. The first is pregnancy-related attrition. Post-recruit training attrition for first term women Marines is approximately 45-50 percent, compared to 30-35 percent for male Marines, and a number of studies have suggested that pregnancy-related attrition accounts for this difference. One study, for example, found that approximately 60 percent of women Marines' attrition after recruit training was pregnancy-related (Royle, 1983). Because the expense of recruiting and maintaining women enlistees is lower than that for men (Hoiberg & Thomas, 1980), and because women enlistees have relatively high scores on the vocational aptitudes tests, this source of attrition is particularly costly to the Corps.

The second problem is that pregnancies that do not result in attrition also have the potential of presenting problems for the Corps. Although it appears that work time lost among women (including pregnancy-related time lost) is less than work time lost among men (Olsen & Stumpf, 1978), pregnancy and the demands of motherhood have the potential of affecting the readiness and productivity of the Marine Corps (Royle, Molof, Winchell, & Gerrard, 1986). Unplanned pregnancy in particular may be problematic because women who are not planning a pregnancy may be less prepared than other women to meet both the demands of motherhood, and their Marine Corps responsibilities.

Antecedents of Pregnancy and Pregnancy Attrition Among First Term Women Marines

There are four previous studies of first term enlisted women Marines' attitudes, characteristics, and behavior relevant to pregnancy and pregnancy attrition. In the first of these, Royle (1983) examined the relation between background variables, Marine Corps experiences, and pregnancy attrition among 1,271 enlisted women Marines who entered the Marine Corps between FY 1976 and FY 1980. Her data suggested that women who attrite because of pregnancy have fewer "masculine" interests (e.g., sports) than pregnant women who remain in the Corps. She also concluded that first term women Marines were not becoming pregnant in order to be discharged, but that many of their pregnancies were unplanned.

The second study in this series compared the backgrounds and Marine Corps experiences of first term women Marines who attrite and those who do not attrite (Kerce & Royle, 1984). This survey of 142

women revealed that women Marines in general have a relatively traditional sex role orientation regarding having a family, and plan to combine motherhood with their careers. However, those with the most traditional family orientations adapted least well to Marine Corps life -- they were less satisfied, and less well-adjusted than those with a less traditional orientation toward family. In fact, the data suggested that the most traditional women were most likely to attrite.

In an extension of this research, Gerrard and Royle (1985) examined traditional sex role orientation, feelings of isolation, and dissatisfaction with the Marine Corps as possible predictors of both pregnancy and pregnancy attrition in 610 first term enlisted women Marines. We found that both pregnancy and pregnancy attrition were predicted by the traditional sex role orientation identified in the earlier two studies. Whether a woman attrited once she was pregnant, was also determined in large part by her commitment to family vs. career. In addition, we found that satisfaction with the Marine Corps did not discriminate between non-pregnant women, pregnant women who remained in the Corps, and women who had a pregnancy-related attrition. Like the Royle (1983) study reviewed above, these data argue against the suggestion that pregnancies in first term women Marines are motivated by a desire to attrite, and suggest instead that many of the pregnancies are unplanned.

In response to these three studies, a fourth study (Royle, Molof, Winchell, & Gerrard, 1986) was designed to assess first term Marines' knowledge, attitudes, and behaviors relevant to unplanned

pregnancy. This study of 169 men and 142 women (primarily recruits) revealed that many women (and men) had not adequately protected themselves from unplanned pregnancy prior to recruit training. More specifically, 10 percent of the women recruits reported using no method of birth control the last time they had intercourse, and another 11 percent reported using relatively ineffective methods (withdrawal and rhythm); 16 percent of the women recruits reported having experienced a pregnancy prior to recruit training, and 64 percent of these pregnancies were ended by abortion.

Official vs. unofficial pregnancies. The two studies that were designed to predict pregnancy and pregnancy attrition (Royle, 1983 and Gerrard & Royle, 1985) both suffer from a limitation in the way in which women were classified as pregnant. In the first study (Royle, 1983), a woman was considered to have a pregnancy-related attrition if the Historical Master File (HMF) or the Recruit Accessions Management Systems file (RAMS) indicated that she separated because she was pregnant. The group defined as pregnant, but remaining in the Corps consisted of women whose HMF indicated that they added a dependent after the completion of recruit training and before completion of their enlistment.

In the second study (Gerrard & Royle, 1985), women were classified as pregnant in three different ways: (1) if the HMF indicated that they had a pregnancy-related separation; (2) if they indicated that they were pregnant at the time of the survey; or (3) if the HMF indicated that they added a dependent with a birth date

between approximately 9 months after recruit training and the end of their first term.

It should be noted that the only pregnancies recognized by the first study were "official" and "public" pregnancies, i.e., those pregnancies for which there was an official separation or birth record. The second study added women who reported that they were pregnant at the time of the survey, but this resulted in the addition of only a small number of women (less than 20). Neither study identified women who conceived, but did not deliver, either because they miscarried or had an abortion. Likewise women who got pregnant but attrited for reasons other than pregnancy were classified as non-pregnant. Given this limitation, the results of both of these studies should be interpreted as related only to "official" and "public" pregnancies, and not to pregnancies ending in abortion or miscarriage.

Pregnancy rate. Two facts suggest that these methods of identifying pregnancies underestimate the actual pregnancy rate in first term women Marines. The first is pilot data on the sexual activity and contraceptive use of women Marines (reported in Gerrard & Royle, 1985). Estimates based on these data suggest that the actual pregnancy rate is significantly higher than the 6 percent (in their fourth year) to 16 percent (in their second year) "official" pregnancy rate per year of the first term enlistment reported in Royle (1983).[2]

The second is data suggesting that abortions are common among women Marines. As was mentioned before, the data collected by Royle, Molof, Winchell, and Gerrard (1986) reveal that 16 percent of women recruits report having had at least one pregnancy prior to recruit

training. Furthermore, 64 percent of these pregnancies were reported to have ended in abortion. Data collected on abortions performed in Navy hospitals on first term Navy women in the early 1970s are consistent with these figures. Hoiberg (1983), reports that the pregnancy attrition rate in the Navy ranged from 12 to 17 percent between 1973 and 1975, and that approximately 10 percent of Navy women received abortions in Navy hospitals each year during that time. Thus, the ratio of abortions to pregnancy attrites ranged between approximately .60 and .80 for those three years. In other words, for every 100 pregnancy attrites in the Navy, there were an additional 60 to 80 women who got pregnant, but chose to end the pregnancy by abortion. Assuming that it is unlikely that many women have an abortion, then get pregnant again and attrite during the same year, and assuming some similarity between women in the Navy and women Marines, these data suggest that the actual pregnancy rate among women Marines may be as much as 10 to 12 percent higher than the total number of women who give birth or attrite because of pregnancy.

Summary. The previous research on pregnancy and pregnancy attrition among first term women Marines suggests that a large proportion of the pregnancies experienced by these women are unplanned pregnancies resulting from the failure to use effective methods of birth control. These pregnancies can be predicted from the women's attitudes and characteristics early in their enlistment. Both pregnancy and pregnancy attrition are predicted more by a traditional sex role orientation that values family and motherhood over career,

than they are by dissatisfaction with the Marine Corps or a desire to attrite.

General Background Literature on the Antecedents of Unplanned Pregnancy

Becoming an effective contraceptor requires that a woman negotiate a complex sequence of psychological and behavioral events including: (a) being aware of the high risk of pregnancy when intercourse is unprotected, (b) obtaining adequate information about contraception, (c) acquiring the contraceptive devices and/or knowledge necessary to prevent pregnancy, and (d) using those devices and/or knowledge consistently and effectively. Women Marines are certainly not the only groups of young sexually active women that fail to successfully negotiate these steps. In fact the Allan Guttmacher Institute estimates that 24 percent of the women in the United States who were age 18 in 1981 had experienced at least one pregnancy, and that 44 percent would become pregnant before age 20 (Hayes, 1987). Research also indicates that most of these young women do not plan to become pregnant.[3] Research on the antecedents of unplanned pregnancy in the general population and in college students has suggested a number of factors that may make first term women Marines a particularly high risk group for unplanned pregnancy.

In spite of the fact that birth control information and sophisticated contraceptive technology are available to most women in the United States, substantial numbers of sexually active women use unreliable methods of contraception (e.g., rhythm, withdrawal), or use no method at all. Over 20 percent of sexually active young women begin practicing birth control only after experiencing a pregnancy

(Tanfer & Horn, 1985). Irregular contraceptive use or use of ineffective forms of contraception is associated with becoming sexually active at an early age, not attending college, and being involved in casual rather than long-term sexual relationships (Adler, 1981; Cvetkovich & Grote, 1983; Fisher et al., 1979; Fugita, Wagner & Pion, 1971).

In addition, there is mounting evidence that ineffective contraceptors can be characterized as uncomfortable with their decision to have sexual intercourse (Gerrard, 1987a, 1987b; Goldfarb, Gerrard, Gibbons, & Plante, 1988; Tanfer & Horn, 1985). That is, some women have a negative predisposition toward sexuality, often exhibited as conservative or conflicted attitudes toward sex, and a lack of acceptance of their own sexuality (Byrne, 1983; Mosher & Cross, 1979). These women tend to be more passive in making decisions about their sexual and contraceptive behavior (D'Augelli & Cross, 1975; Geis & Gerrard, 1984), and have difficulty engaging in rational decision making about contraception. This conflict often results in less frequent use of contraceptive services (Fisher et al., 1979), less frequent use of birth control methods (Fisher, 1978), and an inability to successfully use effective methods even when they are attempted (Gerrard, 1977).

In addition to conflicts over sexuality, Adler (1981) has suggested that situational stress, life changes, and confusion about career goals contribute to high risk for unplanned pregnancy. In sum, this psychological profile of women who are most vulnerable to unplanned pregnancy suggests that first term women Marines may be

particularly at risk -- they are sexually active, have just completed a very stressful time in recruit training, are isolated from family and friends, and are likely to be experiencing uncertainty about their career goals and their relationships with men.

Objectives of the Current Study

The initial goal of the current study was to examine the birth control knowlege, and sexual and contraceptive behavior of women Marines in order to identify barriers to effective contraception. It was designed to:

1. Extend the findings of Royle (1983), Kerce and Royle (1984), Gerrard and Royle (1985), and Royle et al. (1986) by identifying antecedents of pregnancy and pregnancy attrition among first term women Marines.
2. Study the comparability of women Marines and women entering college in order to determine if research conducted on college women is applicable to women Marines.
3. Study the contraceptive knowledge and contraceptive practices of first term women Marines in order to identify the most appropriate content and timing of interventions designed to reduce unplanned pregnancy and pregnancy attrition.

In the spring of 1987, approximately one-half of the initial phase of data collection had been completed at the Parris Island Recruit Training Center. These data indicated that the past sexual experience of the recruits put them at risk of contracting Human Immunodeficiency Virus (HIV). In response to these preliminary

findings the goals of the study were expanded to include collection of data relevant to the prevention of Acquired Immune Deficiency Syndrome (AIDS). At this time a second set of goals was added to those listed above:

1. To assess women Marines' knowledge of AIDS and the transmission of HIV, and their perception of their risk of contracting HIV.
2. To assess the extent to which their sexual activity puts them at risk of contracting HIV.
3. To assess their attitudes toward condom use.

Chapter 2

METHOD

Design

The study was an 18 month longitudinal assessment of knowledge, attitudes, and behaviors relevant to pregnancy and pregnancy attrition among first term women Marines. To control for seasonal variation in recruits, the initial survey was administered to women in 10 different recruit training series over a period of 10 months. Follow-up surveys were mailed to each woman at six month intervals for the duration of the project; one-half of the women were followed for 12 months, and one-half were followed for 18 months (see Table 2.1).

Participants

The primary participants in this study were 956 women Marines surveyed prior to graduation from recruit training at the Parris Island Marine Corps Recruit Training Depot between November 1986 and September 1987. A comparison group of 311 women in their freshman year at three large universities in Iowa, New York and Florida was surveyed between September 1986 and April 1987.[4]

Survey Instrument

Because of the personal nature of many of the questions, the survey instrument was extensively pre-tested on college students prior to the study. The pre-test respondents were encouraged to express concerns, to critique, and to indicate any questions that caused discomfort. In general, pre-test respondents reported little discomfort, although some questions and directions were rewritten to avoiding confusing, offending or embarrassing participants.

Table 2.1

Data Collection Schedule

Series	Initial Data Collection	6-month Follow-up	12-month Follow-up	18-month Follow-up
19	Nov 1986	May 1987	Nov 1987	May 1988
20 & 21	Dec 1986	Jun 1987	Dec 1987	Jun 1988
4004	Feb 1987	Sep 1987	Feb 1988	Sep 1988
4012	May 1987	Nov 1987	May 1988	Nov 1988
4014	Jun 1987	Dec 1987	Jun 1988	Dec 1988
4018 & 4020	Aug 1987	Feb 1988	Aug 1988	
4022 & 4024	Sep 1987	Mar 1988	Sep 1988	

Sexual activity and contraceptive use questionnaire. This instrument is an adaptation of questionnaires used by Royle, Molof, Winchell, and Gerrard (1986), and Geis (1984). It is designed to assess contraceptive and sexual experience, and attitudes toward pregnancy and motherhood.

Birth control opinion questionnaire. This instrument was designed specifically for this study to measure attitudes toward, and biases against specific methods of birth control. It consists of questions about the effectiveness of specific methods, the likelihood that the women would use the methods in the future, and perceptions of possible harm that could result from the use of specific methods.

Birth control knowledge test. This 23 item multiple choice instrument is also an adaptation of the knowledge test used by Royle et al. (1986). It is designed to assess information useful in avoiding unplanned pregnancy rather than biological or technical information about conception and contraception. The internal consistency of this instrument was acceptable (the alpha coefficient = .77).

AIDS knowledge test. This 10 item multiple choice instrument was designed specifically for this study to assess knowledge of the transmission of HIV and safe sex practices. The alpha coefficient for this test was .65.

Sexual Opinion Survey. This 21 item instrument was developed by White, Fisher, Byrne, and Kingma (1977) to assess emotional reactions to sexuality. It has been used extensively and has been shown to be

predictive of both sexual and contraceptive behavior (for a review see Fisher, Byrne, White & Kelley, 1988).

Indicators of pregnancy and pregnancy attrition. A woman could be identified as pregnant in the current study in three ways: the official record of pregnancy attrition provided by Headquarters U.S.M.C., indication on the HMF that the woman had added an infant dependent between completion of recruit training and the end of the study, and self-report of pregnancy on a follow-up questionnaire.

Data Collection Procedures

Initial survey. The initial survey was administered by the Principal Investigator to recruits at Parris Island, usually within a week prior to their graduation from recruit training. The women completed the questionnaires in a classroom setting in groups of between 66 and 112.

The investigator first described the purpose of the study, and the explicit and personal nature of the survey questions to each group of potential participants. She then discussed the procedures developed to to protect the confidentiality of the data. After answering any questions raised by the recruits, the investigator reminded them that participation in the study was voluntary and asked them to sign the informed consent statement if they wished to participate.

Because there is a possibility that women in Marine Corps recruit training would feel coerced even if they were told that their participation was voluntary, potential participants were assured that there would be no adverse consequences associated with either skipping questions that they considered too personal, or not completing the

questionnaire. They were also informed that when it was time for the follow-up surveys, addresses of everyone in the training series would be requested from Headquarters regardless of whether they chose to participate in the study. This safeguard insured that no one at Marine Corps Headquarters would know whether a specific woman declined to participate in the study. Ninety-eight percent of the potential participants completed the initial questionnaire.

Data collection from the college students was conducted in the same manner, except that these women usually completed the questionnaire in smaller groups of 30 to 50. Ninety-nine percent of these women completed the questionnaire.

Follow-up surveys. The follow-up surveys (at 6, 12, and 18 months) were mailed to Marine participants at their duty stations. A second questionnaire packet was sent to women who failed to return a follow-up questionnaire within four weeks after it was mailed. If the questionnaire packet was returned marked "addressee unknown," or "moved, left no forwarding address," the address was confirmed with Headquarters, and a second copy of the questionnaire was mailed. If the second mailing also resulted in the return of the packet by the post office or mail service at the woman's last duty station, the woman was counted as "unreachable" for that follow-up. This procedure resulted in three possible sources of attrition from the current study: (1) failure to locate women for follow-up; (2) participant failure to respond; and (3) attrition from the Marine Corps.

Return Rates and Sources of Attrition from the Study

Subjects who did not return their completed questionnaires, and whose packets were not returned by the post office unopened were classified as "non-responders." The response rate for the six month follow-up was 46 percent, at the 12 month follow-up was 38 percent, and at the 18 month follow-up was 30 percent (see Table 2.2).[5]

In any longitudinal study, participants who respond to the follow-up questionnaires ("responders") may not be a representative sample of the initial participants. To examine this possibility we conducted a series of analyses comparing the initial data (collected at Parris Island) of responders and non-responders at each follow-up.

Demographic variables. The comparison of the age, educational level and General Technical Composite score from the ASVAB of responders and non-responders revealed no significant differences. In addition, the proportions of White, Black, and Hispanic women responding to follow-up questionnaires were the same as the proportions completing the initial survey. These analyses suggest that the responders are a representative sample of the initial group of subjects in terms of these basic demographic variables.

Attitudinal and behavioral variables. Similar analyses were conducted to examine the possibility of response bias based on contraceptive behavior, sexual experience, and attitudes toward sex, birth control, and motherhood. These analyses revealed no evidence of differences on these variables between responders and nonresponders, suggesting that responders were also a representative sample of the initial group of participants in terms of these attitudinal and behavioral variables.

Table 2.2

Return Rate by Series and Follow-up

Follow-up	Series	N Reached	Responses	Response Rate
Six month	19	79	40	51
	20 & 21	163	72	44
	4004	100	52	52
	4012	91	46	51
	4014	97	48	49
	4018 & 4020	164	67	41
	4022 & 4024	140	55	39
	-----	---	---	--
	Total	834	380	46
Twelve month	19	84	32	38
	20 & 21	195	82	42
	4004	91	36	40
	4012	84	24	29
	4014	82	30	37
	4018 & 4020	104	38	37
	-----	---	--	--
	Total	640	242	38
Eighteen month	19	69	23	33
	20 & 21	164	51	31
	4004	74	19	26
	-----	---	--	--
	Total	307	93	30

Privacy Issues

Several measures were instituted to protect the privacy of the women completing the initial survey instrument at Parris Island. First, the women were separated by rows of empty seats in order to assure that they could not see each others' responses to the questions. Second, the women put their names and social security numbers on the informed consent form and then immediately separated this form from the survey instrument. This identifying information was then collected by the investigator and transported by the investigator to Iowa State University separately from the completed questionnaires. Third, each woman was assigned a code number immediately after their data were collected, and the master list of the names and code numbers was stored separately in secure locations at Iowa State University throughout the project.

Chapter 3

SEXUAL BEHAVIOR AND CONTRACEPTIVE USE PRIOR TO RECRUIT TRAINING

Sexual Experience

As a group the women entered recruit training with a significant amount of sexual experience. Eighty-five (85) percent had engaged in sexual intercourse prior to joining the Marine Corps, with the non-virgins reporting an average of 5.7 sexual partners. The sexually experienced women reported having intercourse an average of 8.9 times per month in the 3 months immediately preceding recruit training. Twenty-three (23) percent reported previously experiencing at least one pregnancy prior to joining the Corps, and five (5) percent had been pregnant more than once.

Sex Education, Knowledge and Attitudes about Contraception

The vast majority (88.8%) of the women Marines had been exposed to formal sex education courses, which typically covered a variety of topics, including venereal disease, birth control, values and decision making, and the biology of reproduction. Their knowledge of the most effective methods of contraception was adequate to protect them from unplanned pregnancy. For example, 89 percent of the women knew that the pill is a very effective method of birth control, 88 percent knew that the diaphragm is relatively effective, and 91 percent know how to use a condom to ensure that it is effective (see Table 3.1). There were, however, significant deficits in their knowledge that may increase their vulnerability to unplanned pregnancy. Thirty-three (33) percent thought that the pregnancy rate for sexually active women who use no contraceptives is 60 percent or less. Only 26 percent knew that ovulation occurs 2 weeks prior to the beginning of a woman's

Table 3.1

Women Marine's Responses
to Selected Questions about Contraception

Effectiveness of Specific Methods

1) Which of the following is the most effective?
   a. diaphragm (2%)
   b. withdrawal (1%)
   c. the pill (89%)
   d. condom (7%)
   e. rhythm (1%)

2) The failure rate of the pill is
   a. 1% (73%)
   b. 8% (20%)
   c. 15% (5%)
   d. 30% (2%)

3) Which of the following methods is the most effective?
   a. foam (3%)
   b. diaphragm (88%)
   c. rhythm (4%)
   d. suppositories (3%)
   e. withdrawal (3%)

Rhythm and Timing of Conception

4) Which of the following is true?
   a. if a woman urinates after intercourse, it will reduce her chances of becoming pregnant (18%)
   b. conception (pregnancy) is most likely if the man and woman both reach orgasm at the same time (13%)
   c. douching is an effective means of birth control (3%)
   d. conception is most likely to occur during the middle of a woman's cycle (66%)

5) If you are using the rhythm method, you abstain from having intercourse
   a. when you are menstruating (6%)
   b. from the week after your period ends until after ovulation (54%)
   c. the week before menstruating (35%)
   d. while you are experiencing PMS (5%)

Note: Correct answer is underlined and percent of women Marines giving each answer is indicated in parenthesis.

6) How long after ovulation does a woman's menstrual flow begin (if the egg is not fertilized)?
   a. 2-3 days (28%)
   b. 1 week (36%)
   c. 2 weeks (26%)
   d. 3 weeks (10%)

7) You should not use the rhythm method if
   a. your menstrual flow is typically heavy (1%)
   b. if you have severe menstrual cramps (2%)
   c. if you are prone to headaches (1%)
   d. your menstrual cycle is irregular (96%)

General Birth Control Information

8) What is the pregnancy rate for sexually active women who use no contraceptives?
   a. 35% (5%)
   b. 60% (26%)
   c. 90% (67%)
   d. 20% (2%)

9) A woman who smokes cigarettes should not use
   a. rhythm (11%)
   b. diaphragms (4%)
   c. the pill (82%)
   d. spermicidal foam (3%)

10) To use a condom (rubber), a person must:
   a. leave some space at the tip for the ejaculate (4%)
   b. use a new one every time intercourse occurs (4%)
   c. hold it on the penis when withdrawing the penis from the vagina (1%)
   d. all of the above (91%)

menstrual flow. Consistent with this, only 54 percent of the women knew that practicing rhythm requires abstinence from 1 week after the menstrual flow ends until after ovulation, and only 66 percent knew that conception is most likely during the middle of the menstrual cycle.

The women's knowledge of the effectiveness of specific methods of contraception was reasonably accurate. That is, their answers to the question "How effective is (a specific method) in preventing pregnancy" (on a 7-point scale) matched the actual effectiveness rates (see Table 3.2). Their responses to the question "How likely would you be to use _____" however, did not follow the same pattern (see Table 3.3). More specifically, although they rated the oral contraceptive pill as the method they are most likely to use in the future, and the condom as the second most likely method, they did not differentiate between the remaining (less effective) methods.

In sum, it appears that at the time that they enter the Marine Corps, women recruits have adequate knowledge about the pill, diaphragm, and condoms to avoid unplanned pregnancy, and that their attitudes about the pill (the most effective method of birth control) are relatively positive. They do however, also have specific deficits in knowledge of conception and other methods of birth control which may make them vulnerable to unplanned pregnancy.

Attitudes About Pregnancy

Because the women's attitudes about getting pregnant were considered to be very important, we assessed these attitudes in a variety of ways. We inquired about whether the women planned to ever

Table 3.2

Ratings of Effectiveness of Specific Birth Control Methods by Racial/Ethnic Background

	Typical Failure Rate	All Participants (n=901)	White (n=628)	Black (n=208)	Hispanic (n=65)
Pill	1[a]	1.71[b]	1.63	1.79	1.90
Condom	10	2.95	2.92	2.96	3.16
Sponge	15	3.75	3.70	4.02	3.73
Suppositories	18	4.25	4.24	4.39	4.14
Foam or Jelly	18	4.17	4.12	4.30	4.31
Diaphragm	19	3.25	3.13	3.58	3.44
Withdrawal	23	5.51	5.57	5.63	4.89
Rhythm	24	5.19	5.18	5.39	4.83

[a] Typical failure rate is expressed as the percent of women who would typically get pregnant if using this method over a year (adapted from Hatcher et al., 1986).

[b] Rating scale ranges from 1 = "extremely effective" to 7 = "not at all effective."

Table 3.3

Ratings of Likelihood of Use of Specific Birth Control Methods by Racial/Ethnic Background

	Typical Failure Rate	All Participants (n=906)	White (n=631)	Black (n=210)	Hispanic (n=65)
Pill	1[a]	1.95[b]	1.91	1.99	1.93
Condom	10	3.25	3.26	3.12	3.27
Sponge	15	5.12	5.13	5.17	5.00
Suppositories	18	5.79	5.86	5.60	5.59
Foam or Jelly	18	5.50	5.58	5.41	5.05
Diaphragm	19	5.62	5.61	5.80	4.87
Withdrawal	23	5.44	5.49	5.49	4.83
Rhythm	24	5.62	5.68	5.73	5.02

[a] Typical failure rate is expressed as the percent of women who would typically get pregnant if using this method over a year (adapted from Hatcher et al., 1986).

[b] Rating scale ranges from 1 = "definitely would use" to 7 = "definitely would not use."

have children, and if so how many they would like to have, and at what age they would like to start their families. In addition, we had the women estimate the likelihood that they would experience a pregnancy in the 12 months following recruit training, report their plans for pregnancy during the 3 years following recruit training, indicate how inconvenient they thought it would be if they were to get pregnant in the 12 months following recruit training, and how unhappy they would be if they were to become pregnant during that 12 months.

The answers to the questions regarding eventual childbearing suggest that this sample is relatively traditional. Ninety percent of the women plan to have children at some time in the future, and the average number of children planned is 2.4. They intend to delay the birth of their first child for an average of 5.2 years, or until they are 25 years old. Consistent with this schedule, the women reported that they were not planning to get pregnant during the next 3 years (mean = 5.4 on a 7-point scale where 7 = "definitely do not plan to get pregnant in the next 3 years".)

They estimated that there was a 12 percent chance that they would get pregnant during the 12 months following recruit training, and that such a pregnancy would be "extremely inconvenient" (6.2 on a 7-point scale). However, in contrast to these attitudes, the average answer to the question "How unhappy would you be if you were to become pregnant in the next year?" was neutral (4.7 on a 7-point scale where 7 = "extremely unhappy"). Examination of the distribution of responses to this question revealed a bimodal distribution -- 30 percent of the women indicated that they would not be unhappy

(responses 1, 2, and 3); 36 percent indicated that they would be extremely unhappy, response 7).

In sum, these data suggest that a significant minority of the women are ambivalent toward the possibility of pregnancy in the near future. On the one hand, most of the women Marines are aware that pregnancy during the first year after recruit training would be extremely inconvenient, and they reported planning to postpone motherhood several years. In spite of these attitudes, almost a third of the women reported that if they were to become pregnant during the year following recruit training, they would not be entirely unhappy.

Past Contraceptive Behavior

The women were asked to indicate which methods of birth control they had ever used, which method(s) they usually use, and which method(s) they used the last time they had intercourse. Responses to these questions can be seen in Table 3.4.

Most of the women Marines who had engaged in sexual intercourse prior to recruit training reported experience with a variety of different methods of birth control. Sixty-six percent had used the most effective method, the pill, at some point in the past, and 74 percent had used the second most effective method, condoms. However 63 percent report having relied upon the relatively ineffective method of withdrawal, and over one-half have had unprotected intercourse at some time in the past.

Fifty-five percent of the nonvirgins report using relatively effective methods (i.e., oral contraceptives or condoms) the last time that they had intercourse. However 15 percent reported using the

Table 3.4

Frequency of Use of Birth Control Methods
Prior to Recruit Training

Method	Ever Used	Usually Use	Used Last Time
Pill (1%)[a]	66.0	45.8	39.2
Condom (10%)	73.7	15.4	15.8
Sponge (15%)	12.5	4.0	3.5
Suppositories (18%)	9.2	.9	.9
Foam or Jelly (18%)	14.1	.9	.9
Diaphragm (19%)	3.3	.6	.6
Withdrawal (23%)	62.9	6.0	9.7
Rhythm (24%)	26.4	5.1	5.6
Nothing (90%)	50.7[b]	14.3	19.4

[a] Numbers in parenthesis are the typical failure rates expressed as the percent of women who would typically get pregnant if using this method over a year (adapted from Hatcher et al., 1986).

[b] This is the percent of nonvirgins who reported that they usually do not use birth control or reported that their first or most recent intercourse was unprotected.

relatively ineffective methods of rhythm and withdrawal, and 19 percent reported using no method of birth control the last time that they had intercourse (see Table 3.4). The typical failure rate of the methods the women reported usually using was 19.5 percent, and the typical failure rate of the methods the women reported using the last time that they had intercourse was 25.0 percent.[6]

Previous research has indicated that women often report different methods of birth control when they are asked how they usually protect themselves than when they are asked what method they used last time that they had intercourse. It is our assumption that while answers to the "usual" form of the question reflect past contraceptive behavior, they are biased by the women's awareness of the social desirability of *protecting oneself from* unplanned pregnancy, and possibly self-deception. In other words, we believe that answers to the "usual" form of this question may reflect what the woman thinks that she should have done, or what she wishes that she had done, and that the answer to the "last time" form of the question is a more accurate measure of actual contraceptive behavior.

Comparison of the women's answers to the question "What method do you usually use?" with their answers to the question "What method did you use last time?" supports this assumption. Women are more likely to report usually using effective methods of birth control (i.e., oral contraceptives and condoms) than to report using them the last time that they had intercourse. And fewer women report usually using less effective methods (i.e., withdrawal and no protection) than report using them the last time they had intercourse (see Table 3.4).

Summary. It is difficult to summarize the contraceptive experience of this sample of women Marines. On one hand, the majority of them (66%) have used the most effective method available to them (oral contraceptives) in the past. On the other hand, at least half of them have had unprotected sexual intercourse, and approximately one-fifth report that their last intercourse was unprotected. As a group they appear to have both the knowledge and the experience necessary to practice effective birth control, but between 25 and 35 percent have failed to put this knowledge and experience to use in the recent past.

Variation Across Racial/Ethnic Groups

There were no significant differences in prior sexual experience between the White, Black, and Hispanic women in this sample. There were also no differences between these groups in terms of their plans to have children, and their attitudes about becoming pregnant in the 12 months, and the 3 years following recruit training. However, the Hispanic women's attitudes about, and knowledge of contraception, and their past birth control behavior were significantly different than the attitudes, knowledge, and behavior of the other two racial/ethnic groups. More specifically, the Hispanic women reported having been exposed to less sex education, and not surprisingly had lower scores on the birth control knowledge test (both ts > 2.8, ps < .01). Consistent with this lack of knowledge, the Hispanic women's perceptions of the effectiveness of specific birth control methods were less accurate -- compared to the White and Black women's, they underestimated the effectiveness of the pill and overestimated the

effectiveness of withdrawal and rhythm (see Table 3.2). The Hispanic women's responses to the question about the likelihood that they would use specific methods of contraception in the future follow a similar pattern -- Hispanic women were more likely than Black and White women to report that they would probably use less effective methods such as rhythm and withdrawal (see Table 3.3).

The Hispanic women were also more likely to report having used rhythm and withdrawal, and less likely to report having used oral contraceptives. The typical failure rate of the sexually active Hispanic women's usual methods of contraception prior to recruit training was 30.5 percent, and the typical failure rate of the method they used the last time that they had intercourse was 31.4 percent.[7] Thus the Hispanic women do not appear to demonstrate the bias in reporting usual vs. last birth control methods that White and Black women do.

Projected Pregnancy Rates

If we assume that the birth control method a woman reported using the last time she engaged in intercourse is a good predictor of her future contraceptive use, then it is possible to compute a projected pregnancy rate for the sample, and for subsamples such as racial/ethnic groups. The formula for this computation is:

$$\sum_{i=1}^{n} [p_i \; FR_i \; fq_i + c] \; (P)$$

where p_i = proportion of women using method i

FR_i = typical failure rate for method i
fq_i = adjusted frequency of intercourse for women using method i
c = correction factor for missing data
P = proportion of women who are sexually active

Using this formula, we projected that between 21 and 25 percent of the women Marines would get pregnant in the first year of their enlistment.[8] Using this formula to project separate pregnancy rates for White, Black, and Hispanic women (see Tables 3.5, 3.6 and 3.7), we estimated that the first year pregnancy rate for White women would be 21.1 percent, for Black women would be 20.4 percent, and for Hispanic women would be 23.0 percent. These figures are significantly higher than the average 16 percent pregnancy rate for American women ages 20-24 (Jones, Forrest, Henshaw, Silverman, & Torres, 1988).

Variation Across Series

There was a significant amount of variability in the prior sexual experience of women in different Recruit Training series. Although concluding that this variation is due to seasonal variation in the type of recruit entering training would require data from several years, the variability is large enough to warrant comment.

As can be seen on Table 3.8, the women in recruit training Series 4018, 4022, and 4024 had the least prior sexual experience, and those in Series 4004 had the most prior sexual experience. Projected pregnancy rates for the different series in this sample suggests that the women in Series 4004 will be at considerably more risk of pregnancy (28% projected to become pregnant) than the women in Series 4012 (16% projected to become pregnant).

Table 3.5

Projected First Year Pregnancy Rate for White Women Marines

	% using method at last intercourse	x	failure rate	=	weighted failure rate	x	adjusted activity	=	projected pregnancy rate
Condom	15.7		.100		.0157		0.84		.0132
Foam/Jelly	1.1		.200		.0022		1.94		.0043
Pill	39.9		.025		.0100		1.42		.0142
Withdrawal	9.9		.225		.0223		1.18		.0263
Rhythm	4.9		.300		.0147		0.71		.0104
Suppositories	.7		.200		.0014		0.63		.0009
Sponge	3.2		.150		.0048		1.32		.0063
Diaphragm	.7		.175		.0012		1.41		.0017
Nothing	19.6		.850		.1667		0.96		.1600
Missing data	4.3		.239[a]		.0103[a]		1.16[a]		.0119

Total projected pregnancy rate = .2111 - .2492[b]

[a] The average failure rate and activity level for White women marines were used for subjects who neglected to respond to the questions about their method and/or frequency of intercourse.

[b] Low estimate assumes that women who were virgins when they entered the Marine Corp will not get pregnant during the first year; high estimate assumes they will become sexually active and get pregnant at the same rate as other White women Marines.

Table 3.6

Projected First Year Pregnancy Rate for Black Women Marines

	% using method at last intercourse x	failure rate	= weighted failure rate x	adjusted activity =	projected pregnancy rate
Condom	11.9	.100	.0119	0.74	.0088
Foam/Jelly	0	.200	-	-	-
Pill	44.9	.025	.0112	1.099	.0123
Withdrawal	9.7	.225	.0218	0.42	.0092
Rhythm	5.9	.300	.0177	1.02	.0181
Suppositories	1.1	.200	.0022	1.50	.0033
Sponge	3.2	.150	.0048	1.32	.0063
Diaphragm	0	.175	-	-	-
Nothing	17.8	.850	.1513	1.09	.1649
Missing data	5.5	.221[a]	.0121[a]	0.98[a]	.0119

Total projected pregnancy rate = .2040 - .2348[b]

[a] The average failure rate and activity level for Black women marines were used for subjects who neglected to respond to the questions about their method and/or frequency of intercourse.

[b] Low estimate assumes that women who were virgins when they entered the Marine Corp will not get pregnant during the first year; high estimate assumes they will become sexually active and get pregnant at the same rate as other Black women Marines.

Table 3.7

Projected First Year Pregnancy Rate for Hispanic Women Marines

	% using method at last intercourse	x	failure rate	=	weighted failure rate	x	adjusted activity	=	projected pregnancy rate
Condom	18.9		.100		.0189		.44		.0083
Foam/Jelly	1.9		.200		.0038		.50		.0019
Pill	22.6		.025		.0057		1.53		.0087
Withdrawal	9.4		.225		.0212		1.23		.0261
Rhythm	11.3		.300		.0339		.81		.0275
Suppositories	0		.200		-		-		-
Sponge	5.7		.150		.0086		2.29		.0197
Diaphragm	1.9		.175		.0033		.001		.0000
Nothing	24.5		.850		.2083		.896		.1866
Missing data	3.8		.304[a]		.0115[a]		1.01[a]		.0116

Total projected pregnancy rate = .2297 - .2904[b]

[a] The average failure rate and activity level for Hispanic women marines were used for subjects who neglected to respond to the questions about their method and/or frequency of intercourse.

[b] Low estimate assumes that women who were virgins when they entered the Marine Corp will not get pregnant during the first year; high estimate assumes they will become sexually active and get pregnant at the same rate as other Hispanic women Marines.

Table 3.8

Prior Sexual Experience and Projected Pregnancy Rate by Series

Recruit Training Series	Month of Graduation	% With Prior Sexual Experience[a]	Mean Number of Partners[b]	Average Frequency of Intercourse[c]	Projected Pregnancy Rate Per Year
19 (n=88)	Nov 1986	88	6.05	2.32	24%
20 & 21 (n=217)	Dec 1986	84	5.20	2.37	20%
4004 (n=112)	Feb 1987	92	7.12	2.47	28%
4012 (n=99)	May 1987	90	6.71	2.11	16%
4014 (n=106)	Jun 1987	88	5.79	2.33	21%
4018 & 4020 (n=173)	Aug 1987	79	5.30	1.82	19%
4022 & 4024 (n=145)	Sep 1987	81	4.63	2.13	22%

[a] Prior sexual experience is defined as having engaged in sexual intercourse.

[b] Computed for nonvirgins only.

[c] Average frequency of intercourse per week for nonvirgins.

Chapter 4

COMPARISON OF WOMEN MARINE'S AND COLLEGE WOMEN'S PRIOR SEXUAL EXPERIENCE AND CONTRACEPTIVE BEHAVIOR

One of the purposes of the current study was to assess whether the results of previous studies of psychological factors associated with effective contraception in college students can be generalized to women Marines. In order to be able to compare the women Marines in this study with college women, we collected data on a sample of 311 freshmen women from three large universities in Florida, Iowa, and New York between September, 1986 and February, 1987. The data collection procedures, and survey instruments were the same as those used for the women Marines.[9]

Attitudes about Motherhood and Pregnancy

Previous research has indicated that women Marines have relatively traditional attitudes about motherhood and pregnancy (Gerrard & Royle, 1985). Comparison of the Marines and college women in the current study supports this earlier finding. The vast majority of both groups plan to have children (95% of college women and 90% of women Marines; see Table 4.1).[10] Women Marines who want to have children plan to start their families earlier, however, than do college women who want to have children. Consistent with these differences in plans for childbearing, women Marines rate the possibility of getting pregnant during the next 12 months as significantly less "inconvenient" than do college students. Women Marines also report that they would be significantly less "unhappy" if they were to become pregnant during that time.[11] In addition, the

Table 4.1

Attitudes Toward Motherhood and Pregnancy
of Women Marines and College Women

	Women Marines	College Women	Test of Significance
Plan to have children	90%	95%	$z = 2.69$, $p < .01$
Number of children planned	2.46	2.73	$t(1151) = 3.97$, $p < .001$
Age that first child is planned	24.85	25.76	$t(1129) = 4.90$, $p < .001$
Plan pregnancy in next 3 years[a]	5.35	6.60	$t(1258) = 10.53$, $p < .001$
Inconvenience of pregnancy in next 12 months[b]	6.18	6.66	$t(1260) = 4.99$, $p < .001$
Unhappiness if pregnant in next 12 months[c]	4.67	6.18	$t(1259) = 11.04$, $p < .001$
Perceived likelihood of pregnancy in next 12 months[d]	12.22	7.58	$t(1252) = 3.60$, $p < .001$

[a] Rating scale ranges from 1 = "definitely plan to get pregnant in next 3 years" to 7 = "definitely do not plan to get pregnant in next 3 years."

[b] Rating scale ranges from 1 = "not at all inconvenient" to 7 = "extremely inconvenient."

[c] Rating scale ranges from 1 = "not at all unhappy" to 7 = "extremely unhappy."

[d] Rating scale ranges from 0 = "no chance" to 100 = "definitely will get pregnant."

women Marines' ratings of the likelihood that they will have an unplanned pregnancy during the next 12 months are significantly higher than the college women's ratings. Separate analysis of the White, Black, and Hispanic women's attitudes toward childbearing and plans to get pregnant revealed the same patterns of differences between women Marines and college students.

Sexual Behavior and Attitudes toward Sex

As can be seen in Table 4.2, the women Marines are significantly more sexually experienced and sexually active than the college women even when the age difference was taken into account. Sixty-six percent of the college women reported that they had previously engaged in sexual intercourse, as compared with 85 percent of the women Marines. The sexually active women Marines also reported engaging in intercourse more frequently than did the sexually active college women (8.9 vs. 6.0 times per month), and reported having had more sexual partners than the college women (5.7 vs. 3.9 partners). The same pattern emerges when White women Marines are compared with White college students, Black women Marines are compared with Black college students, and Hispanic women Marines are compared with Hispanic college students.

A comparison of women Marines' and college women's attitudes toward sex, as measured by the Sexual Opinion Survey (White, Fisher, Byrne & Kingma, 1977) does not reveal a significant difference. Thus, the Marines' higher level of sexual activity is not accompanied by more liberal attitudes toward sex.

Table 4.2

Prior Sexual Experience of
Women Marines and College Women

	Women Marines	College Women	Test of Significance
Had prior sexual experience	85%	66%	$z = 7.31$, $p < .001$
Frequency of intercourse[a]	8.9	6.0	$t(975) = 438$, $p < .001$
Number of partners[b]	5.7	3.9	$t(957) = 3.26$, $p < .01$

[a] For women Marines this is the average frequency of intercourse per month over the 3 months prior to recruit training; for college women it is the average frequency per month over the 3 months prior to completing the survey.

[b] Total number of sexual partners prior to completion of the survey.

Contraceptive Use

There was no difference between the women Marines' and college women's knowledge about birth control (both groups' mean score on the birth control test was 16 out of 23). There were, however significant differences in their use of contraceptives. The women Marines were significantly more likely than the college women to report using rhythm (6% vs. 2%), and were less likely to report using condoms (16% vs. 38%) the last time they had sexual intercourse; see Table 4.3). Women Marines were also significantly more likely than the college women to report that their last intercourse was unprotected by any method of birth control (19% vs. 8%). Again, comparison of the White women Marines with white college students, Black women Marines with Black college students, and Hispanic women Marines with Hispanic college students revealed the same pattern of differences.

These differences in the use of contraceptives resulted in the typical failure rate for the method used by women Marines at their last sexual intercourse prior to recruit training being significantly higher than the typical failure rate of the average college woman's last contraceptive method (25% vs. 16%; see Table 4.3). Likewise, the typical failure rate of the average woman Marine's usual contraceptive method prior to recruit training was significantly higher than that of the average college woman (20% vs. 11%; see Table 4.4). Similar results were found when White women Marines were compared with White college students (for usual method: 19% vs. 9%; for last method: 25% vs. 15%). There were no significant differences, however, between

Table 4.3

Percent of Women Marines and College Women
Reporting Use of Specific Contraceptive Methods
(at Last Intercourse)

	Women Marines				College Women			
	Total	White	Black	Hispanic	Total	White	Black	Hispanic
Oral Contraceptives	39	40	45*	23	32	35	21*	20
Condom	16*	16*	12	19*	38*	37*	26	50*
Rhythm	6*	5*	6	11	2*	1*	5	0
Withdrawal	10	10	10	9	14	14	21	10
None	19*	20*	18	25	8*	7*	11	20
Typical Failure Rate for Group	25*	25*	23*	32	16*	15*	22*	26

* College women and women Marine's percentages are significantly different at $p < .05$.

Table 4.4

Percent of Women Marines and College Women
Reporting Use of Specific Contraceptive Methods
(Usual Method)

	Women Marines				College Women			
	Total	White	Black	Hispanic	Total	White	Black	Hispanic
Oral Contraceptives	46*	46	52	30	38*	38	47	20
Condom	15*	16*	11	17	41*	43*	16	40
Rhythm	5*	5*	5	8	2*	1*	5	0
Withdrawal	6	7	5	8	5	5	11	0
None	14*	13*	14	25	4*	2*	5	30
Typical Failure Rate	20*	19*	19	30	11*	9*	12	35

* College women and women Marine's percentages are significantly different at $p < .05$.

the contraceptive effectiveness of the Black and Hispanic women Marines and that of the Black and Hispanic college students.

Relationship Between Attitudes and Sexual Behavior

One of the most stable findings in the literature on the psychological antecedents of sexual behavior is that negative attitudes toward sex are associated with lower levels of sexual experience -- that is, women who are uncomfortable with their sexuality (erotophobics), are less likely to have ever engaged in sexual intercourse, have fewer sexual partners, and report lower frequencies of intercourse than do women with positive attitudes toward their sexuality (erotophilics; cf., Byrne, 1983; Mosher & Cross, 1979). As was noted above however, the research on this relationship between attitudes and sexual behavior has been conducted primarily on college students.

Thus, the first question we addressed was whether attitudes toward sex predict sexual behavior in women Marines. It appears that the dimension of erotophobia/erotophilia does predict sexual activity in the women Marines: erotophobic women Marines were almost twice as likely as erotophilic women Marines to be virgins entering recruit training (19.2% vs. 10.0%). The sexually active erotophobic women Marines also reported fewer sexual partners than did the sexually active erotophilic women Marines (4.3 vs. 7.3), and less frequent intercourse (7.9 times per month vs. 10.2 times per month).

Thus it appears that the general finding that erotophilics are more sexually active and sexually experienced than erotophobics does generalize to women Marines. This pattern of differences between

erotophobic and erotophilic women's sexual activity levels was the same for the Black, White, and Hispanic subsamples.

Relationship Between Attitudes and Contraceptive Behavior

The second question relevant to attitudes toward sex regards the relation between these attitudes and contraceptive behavior -- do conservative attitudes toward sex inhibit the use of effective contraceptive methods? Analysis of the Black and White women Marine subsamples indicates that there are no significant differences in these erotophobic and erotophilic women's contraceptive behaviors. However comparison of the erotophobic and erotophilic Hispanic women Marines' contraceptive behavior suggests that the Hispanic women's attitudes toward sex do predict their use of birth control. For example, the typical failure rate of the erotophobic Hispanic women's usual contraceptive methods was 40.5% as compared to 20.4% for the erotophilic Hispanic women's usual contraceptive methods ($F(1,41) = 3.34$, $p < .05$, one-tailed).[12]

Summary

While both the college women and women Marines are relatively traditional in terms of their plans for motherhood, the women Marines plan to have larger families, and plan to start having children at a younger age than do the college women. In spite of the fact that the women Marines' attitudes toward sex are very similar to those held by the college women, they have significantly more sexual experience and are more sexually active than the college women. Unfortunately, they are also less effective contraceptors than college women, and are therefore more vulnerable to unplanned pregnancies.

Chapter 5

CHANGES IN ATTITUDES TOWARD SEX, AND SEXUAL AND CONTRACEPTIVE BEHAVIORS AFTER RECRUIT TRAINING

Attitudes toward Motherhood and Pregnancy

Women Marines' attitudes toward motherhood and pregnancy changed significantly during the six months immediately following recruit training. As can be seen in Table 5.1, there was no change in the proportion of women planning to have children. However, among those who did plan to have children, they changed their opinions about when they should have their first child by almost one year during this six month period of time (from planning to have their first child at an average age of 24.9 to 24.1.) Consistent with this trend toward more traditional (family oriented) values, the number of children they planned to have increased (from 2.4 to 2.6), and the women became more likely to report that they were planning to have a child within the next three years.[13]

The women's perceptions of the "inconvenience" of a pregnancy, and their perceptions of how "unhappy" they would be if they were to become pregnant, also changed during the first six months following recruit training. More specifically, the women perceived that a pregnancy during the coming year would not be as "inconvenient" as they had previously thought it would be, and there was a smaller, but parallel shift in their perceptions of how "unhappy" they would be if they were to become pregnant. After this shift in attitudes during the first six months, this cluster of attitudes toward pregnancy and motherhood stabilized.

Table 5.1

Attitudes Toward Motherhood and Pregnancy After Recruit Training

Question	Mean Response at: Recruit Training	6-month Follow-up	12-month Follow-up	18-month Follow-up	Test of Significance
Do you ever plan to have children? (% answering yes)	92%	92%	89%	91%	n.s.
At what age would you like to start having children?	24.9[a]	24.1[b]	24.0[b]	23.7[c]	Recruit training vs 6 month repeated measures ANOVA $F(1,299) = 44.73$, $p < .001$; 12 month vs 18 month $F(1,52) = 4.39$, $p < .05$
How many would you like to have?	2.4[a]	2.6[b]	2.5[b]	2.5[ab]	Recruit training vs. 6 month repeated measures ANOVA $F(1,318) = 7.58$, $p < .01$
How much are you planning on getting pregnant in the next 3 years? (1 = definitely 7 = definitely not	5.4[a]	4.6[b]	4.4[b]	4.4[b]	Recruit training vs. 6 month repeated measures ANOVA $F(1,366) = 54.93$, $p < .001$
How inconvenient would it be for you to get pregnant in the next year? (1 = not at all, 7 = extremely)	6.2[a]	5.3[b]	5.1[b]	4.9[b]	Recruit training vs. 6 month repeated measures ANOVA $F(1,370) = 79.12$, $p < .001$

Note: Means without common superscripts are significantly different at $p < .05$.

Table 5.1 (continued)

Question	Mean Response at: Recruit Training	6-month Follow-up	12-month Follow-up	18-month Follow-up	Test of Significance
How unhappy would you be if you were to become pregnant in the next year? (1 = not at all, 7 = extremely)	4.7[a]	4.1[b]	3.9[b]	3.8[b]	Recruit training vs. 6 months repeated measures ANOVA $F(1,369) = 32.24$, $p < .001$

While these changes should not be interpreted as an increased desire to become pregnant, the data indicate that at least 40 percent of the women did think that a pregnancy would not be as negative an event as they had previously thought that it would be.

Attitudes toward Sex and Sexual Behavior

The women Marines' attitudes about sex became significantly more liberal during the first six months after recruit training (the mean Sexual Opinion Survey score increased from 50.3 to 58.1). This shift to more liberal attitudes about sex was accompanied by a significant increase in the number of nonvirgins (from 85.1% to 93.0%).

There was also a significant increase in the average number of partners the women Marines had sexual intercourse with during this six month period of time. On the average, the women reported that they had sexual intercourse with 5.7 men during the approximately four years that they had been sexually active prior to recruit training. Thus they had an average of 1.4 partners per year prior to recruit training. In contrast, they reported engaging in sexual intercourse with an average of 2.7 men during the first six months after recruit training (see Table 5.2). Their number of sexual partners then decreased to an average of 2.0 partners during the period between six and twelve months after recruit training, and to 1.6 partners during the period between twelve and eighteen months after recruit training.

During the first six months after recruit training, the women engaged in intercourse at approximately the same rate that they had in the three months prior to recruit training (average frequency before recruit training = 8.9 times per month, average frequency during the

Table 5.2

Attitudes Toward Sex and Sexual Behavior After Recruit Training

Question	Mean Response at: Recruit Training	6-month Follow-up	12-month Follow-up	18-month Follow-up	Test of Significance
Sexual Opinion Survey total	50.3[a]	58.1[b]	58.9[b]	57.9[ac]	Recruit training vs. 6 month repeated measures ANOVA $F(1,320) = 40.16$, $p < .001$
Have you ever engaged in sexual intercourse? (% answering yes)	85.1%[a]	93.0%[b]	95.8%[bc]	98.9%[c]	Recruit training vs. 6 month comparison $z = 3.88$, $p < .05$; 6 month vs. 18 month comparison $z = 2.11$, $p < .05$
How many sexual partners have you had? (in the last 6 months)	-	2.7[a]	2.0[b]	1.6[b]	6 month vs. 12 month repeated measures ANOVA $F(1,150) = 7.76$, $p < .01$
On the average, how often have you been engaging in sexual intercourse (average number of times per month for the last 3-6 months)	8.9[a]	9.9[a]	12.5[b]	12.7[b]	6 month vs. 12 month repeated measures ANOVA $F(1,149) = 7.01$, $p < .01$

Note: Figures without common superscripts are significantly different at $p < .05$.

six months following recruit training = 9.9 times per month). Their frequency of intercourse rose significantly between six and twelve months after recruit training to approximately 12.5 times per month, and then stabilized.

Attitudes toward Birth Control

With one important exception, the women Marines' attitudes toward birth control remained stable throughout the eighteen months of this study. The exception was their attitudes toward the pill -- six months after recruit training they reported thinking that the pill is more harmful to a woman's health than they previously had thought it was. During this period of time, they also became more accurate in their estimates of the likelihood that they would have an unplanned pregnancy during the coming year. More specifically, their estimates of the probability that they would have an unplanned pregnancy during the next twelve months increased from 12.2 percent at the end of recruit training to 21.8 percent six months after recruit training (see Table 5.3).

Contraceptive Behavior

There was a significant decrease in the women's use of effective contraceptives during the first six months after recruit training. Both the birth control methods the women reported usually using, and the methods they reported using at their last sexual intercourse are less effective than the methods they reported using prior to recruit training (the typical failure rate of their last method increased from 24.9% prior to recruit training to 32.3% by six months after recruit

Table 5.3

Attitudes Toward Birth Control and Contraceptive Behavior After Recruit Training

Question	Mean Response at: Recruit Training	6-month Follow-up	12-month Follow-up	18-month Follow-up	Test of Significance
How harmful is using the pill compared to the possible harm to a woman's health due to pregnancy and childbirth? (1 = much more, 7 = much less)	5.0[a]	4.3[b]	4.8[b]	4.7[b]	Recruit training vs. 6 month repeated measures ANOVA $F(1,331) = 27.35$, $p < .001$; Recruit training vs 12 month $F(1,225) = 10.92$, $p < .001$
What do you think is the likelihood that you will get pregnant in the next 12 months? (0% = no chance, 100% = definitely will)	12.2%[a]	21.8%[b]	20.5%[b]	24.2%[b]	Recruit training vs. 6 month repeated measures ANOVA $F(1,360) = 35.66$, $p < .001$
Effectiveness of usual birth control method	19.8%[a]	33.3%[b]	28.0%[b]	38.4%[b]	Recruit training vs. 6 month repeated measures ANOVA $F(1,278) = 28.47$, $p < .001$
Effectiveness of last birth control method	24.9%[a]	32.3%[b]	24.4%[a]	37.6%[b]	Recruit training vs. 6 month repeated measures ANOVA $F(1,294) = 5.03$, $p < .05$

Note: Means without common superscripts are significantly different at $p < .05$.

training; the typical failure rate of their usual method increased from 19.8% to 33.3% during this time period.)

The effectiveness of the women's contraceptive behavior appears to increase somewhat by twelve months after recruit training and decrease again by the eighteen month follow-up. It should be noted, however, that these changes in contraceptive effectiveness after the six month follow-up were not statistically significant.[14]

Summary

The first six months after recruit training appears to be a period of attitudinal and behavioral change for women Marines. This period is characterized by a shift to more traditional, family oriented plans for the future. It is also characterized by more liberal attitudes toward sex, and more sexual partners than they had prior to recruit training. This period is also one of significant changes in contraceptive effectiveness -- the women become less effective contraceptors than they were prior to recruit training, and therefore become more vulnerable to unplanned pregnancies. During the period between six and twelve months after recruit training the women's attitudes toward motherhood and pregnancy stabilize, and their number of sexual partners begins to decrease. Their frequency of intercourse however, increases significantly, and their contraceptive use remains relatively ineffective. Thus they continue to be at relatively high risk of unplanned pregnancy during this period of time. The data suggest that the risk of unplanned pregnancy remains high throughout the first eighteen months after recruit training.

Chapter 6

VULNERABILITY TO HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION

HIV Risk Factors Prior to Recruit Training

The primary purpose of the current study was to examine factors associated with pregnancy and pregnancy attrition in first term women Marines. However during the course of the initial data collection, it became evident that these women's sexual and contraceptive behavior put them at risk of exposure to HIV. More specifically, 85 percent of the women Marines were nonvirgins prior to entering recruit training, and the sexually active recruits had an average of 5.7 sexual partners prior to entering recruit training and was engaging in intercourse 8.9 times per month (see Table 6.1). These indications that women Marines are a relatively sexually active group, and the growing concern about heterosexual transmission of HIV in the United States, led to the decision to ask the women questions relevant to their vulnerability to heterosexual transmission of HIV, and their relevant preventive behaviors. (Because these questions were added after the study was underway, the sample sizes for these analyses are smaller than those reported in earlier chapters; i.e., these data were collected from only 522 women Marines.)

Are Women Marines Aware That They Are At Risk?

A number of studies have demonstrated that in general people tend to underestimate their own vulnerability to illness and accidents (cf. Harris & Guten, 1979; Perloff & Fetzer, 1986; Weinstein, 1980, 1982, 1984). It has also been demonstrated that people who do not think

Table 6.1

Women Marine's HIV Relevant Behaviors
(Prior to Recruit Training)

Question	
Have you ever engaged in sexual intercourse intercourse?	85%
How many sexual partners have you had? (total since becoming sexually active)	5.7
How often do you engage in intercourse? (times per month)	8.9
Have you ever brought up the topic of sexually transmitted diseases and/or started a conversation about your partner's sexual history prior to engaging in sexual intercourse?	72%
Have you ever initiated such a conversation with a partner after you had sex with him?	55%
Have you ever brought up the topic of condom use with a sexual partner?	76%
Have you ever insisted that a partner use a condom?	52%
Have you ever bought a condom?	28%
What method of contraception do you usually use? (% answering condom)	15%

Note: Unless indicated otherwise, figures represent percent of subjects responding "yes."

that they are vulnerable to a specific problem are less likely to engage in behaviors aimed at reducing the likelihood of that problem. For example, perceived invulnerability to some diseases predicts failure to obtain immunization against those diseases, and perceived invulnerability to automobile accidents predicts failure to wear seat belts (Cummings, Jette, Brock, & Haefner, 1979; Slovic, Fischhoff & Lichtenstein, 1978; for a review of this literature see Janz & Becker, 1984).

In order to examine the possibility that women Marines consider themselves to be relatively invulnerable to HIV infection, we asked each woman to estimate the likelihood that they, other women Marines, and civilian women would contract HIV within the next 12 months:

> The next set of questions is designed to measure your perceptions of the likelihood that you and others will contract the virus responsible for AIDS. For these questions we want you to fill in any number that you think is appropriate. For example, 1 in : 1 would suggest that you think that the event <u>will definitely happen</u>, i.e., there is a 100% chance that it will happen. 1 in : 1000 suggests that you think that the event is <u>unlikely</u>, i.e., there is a .10% chance that it will happen. 1 in :100,000 suggests that you think that the event is <u>extremely unlikely</u>, i.e., there is a .001% chance that it will happen. You may use any number that you think is appropriate.
>
> What is the likelihood that you will contract the AIDS virus in the next year? 1 in: ____.
>
> What is the likelihood that the average woman Marine will contract the AIDS virus in the next year? 1 in: ___.
>
> What is the likelihood that the average civilian woman your age will contract the AIDS virus in the next year? 1 in: ___.

The responses to these questions provide clear evidence that women Marines suffer from what is generally referred to as an "illusion of invulnerability" to HIV. Their mean estimates of their own likelihood

of contracting HIV were significantly lower than the actual rate of HIV infection in military personnel (1:885,891 vs. approximately 1 in 1,200; F. Garland, personal communication, November, 1987). In addition, the women's estimates of their own likelihood of contracting HIV were significantly lower than their estimates for other women Marines and civilian women (all $ts > 12.00$, $ps < .001$). In other words, at the time of the initial survey (recruit training), women Marines significantly underestimated their vulnerability to HIV infection.

Preventive Behaviors Prior to Recruit Training

Once a woman has realized that she is vulnerable to HIV, the process of protecting herself is difficult for two reasons. First, sexually active couples are often uncomfortable in discussing contraception (Byrne, 1983; Connolly, 1978; Knox, 1984); and second, initiating the use of the major protective measure, the condom, is generally considered to be the man's responsibility rather than the woman's responsibility (Gerrard, Breda & Gibbons, in press). Thus an important part of a woman's efforts to protect herself from HIV infection is being able, and willing to take the initiative in discussing protection, obtaining condoms, and insisting on their use.

The women Marine's responses to questions about taking the initiative in discussing protection against HIV suggest that almost three-fourths (72%) of these women have taken an active role in communicating with a partner about sexually transmitted diseases sometime in the past. Over one-half report that they have insisted upon the use of a condom at some time in the past. Only 28 perc[illegible]t,

however, have actually provided the means of protection themselves by buying condoms, and only 15 percent report that they usually used condoms prior to recruit training (see Table 6.1). Thus it appears that prior to recruit training, women Marines had some experience initiating discussions with partners about safe sex, and about one-half of them had at some time insisted that a partner use a condom. However few had ever taken the initiative in terms of buying condoms, and even fewer reported that they regularly used condoms.

Knowledge of AIDS and HIV Transmission

The data on buying and using condoms stand in sharp contrast to the women's knowledge that AIDS can be transmitted sexually and that condoms offer protection from the virus. More specifically, the vast majority of the women Marines indicated that they knew that AIDS can be transmitted sexually (95%), and that condoms provide relatively effective protection against the virus (98%). However less than two-thirds of the women Marines (64%) knew that HIV carriers were contagious during the early stages of the infection as well as the later stages. Thus, although the women Marines were aware of the disease, and aware that condoms could protect them from infection, this knowledge was not sufficient to motivate them to buy and use condoms on a regular basis.

Changes in Risk Behavior after Recruit Training

As was noted earlier (see Chapter 5) the first 18 months after recruit training are a period of increased sexual activity among women Marines. More specifically, a greater percentage of women Marines are sexually active at this time, and both the average frequency of

intercourse and the average number of partners increase (see Table 6.2). However, there appears to be no change in the percent of women Marines who insist that their partners use condoms, or the percent of women Marines that buy condoms. There is however, a significant decrease in the number of women Marines reporting that they usually use condoms (15% prior to recruit training, 7% at 6 months, 5% at 12 months, and 6% at 18 months).

Summary

It appears that women Marines know enough about AIDS and HIV infection to protect themselves, and the majority have the experience necessary to initiate communication with their partners about protection and safe sex. However it also appears that they do not consider themselves to be at risk of infection, that few of them provide the protection (i.e., buy condoms) themselves, and even fewer actually use condoms on a regular basis. Furthermore it appears that increased sexual activity and decreased condom use after recruit training may be putting these women at higher risk for HIV infection during the first 18 months after recruit training than they were prior to recruit training.[15]

Table 6.2

Changes in Women Marine's HIV Relevant Behaviors at
6 Months, 12 Months, and 18 Months After Recruit Training

Question	Mean Response at: Recruit Training	6 month Follow-up	12 month Follow-up	18 month Follow-up	Test of Significance
Percent Sexually Experienced	85%[a]	93%[b]	96%[b]	99%[c]	Recruit training vs. 6 month $z = 3.88$, $p < .05$; 6 month vs. 18 month $z = 2.11$, $p < .05$
Frequency of intercourse (per month)	8.9[a]	9.9[b]	12.5[b]	12.7[b]	6 month vs. 12 month repeated measures ANOVA $F(1,150) = 7.01$, $p < .01$
Number of Partners in last 6 months	--	2.7[a]	2.0[b]	1.6[b]	6 month vs. 12 month repeated measures ANOVA $F(1,150) = 7.76$, $p < .01$
Ever insist partner use a condom?	58%[a]	48%[b]	49%[b]	48%[b]	Recruit training vs. 6 month $z = 2.59$, $p < .05$
Ever bought a condom?	32%	36%	35%	40%	n.s.
Usually use condoms	15%[a]	7%[b]	5%[b]	6%[b]	Recruit training vs. 6 month $z = 3.52$, $p < .05$

Note: Unless otherwise indicated, figures represent percent of women responding "yes." 6, 12, and 18 month responses are responses about behavior in last 6 months only, i.e., at recruit training the question is in the form "Have you ever?" and at each follow-up the question is "Have you in the last 6 months?" Figures without common superscripts are significantly different at $p < .05$.

Chapter 7

ANTECEDENTS OF PREGNANCY AND PREGNANCY ATTRITION

Pregnancy Rate

Thirty-nine of the women (10.5%) who responded to the 6 month follow-up questionnaire reported conceiving since recruit training (see Table 7.1). Thirty-nine of the women (14.5%) who responded at 12 months reported having conceived between 6 and 12 months after recruit training. The cumulative pregnancy rate for the first year following completion of recruit training was between 18 and 25 percent.[16]

Eighteen month follow-up data were collected from only 88 women. Twenty of these women (22.7%) reported conceiving between 12 months and 18 months after recruit training.

Outcomes of pregnancies. Sixty percent of the women who conceived in the first 18 months after recruit training reported that they intended to carry their pregnancies to term and keep their babies. Twelve percent reported miscarriages and 19 percent reported induced abortion. (The remaining 9 percent were still pregnant and undecided about their plans at the time of the survey.)

Pregnancy Attrition

Pregnancy discharge data provided by Headquarters U.S.M.C. (through July, 1989) were used to compute the pregnancy attrition rate for each 6 month period following completion of recruit training. Because the women Marines in this study completed recruit training between November, 1986 and September, 1987, the data represent attrition rates for between 18 and 30 months following completion of recruit training, depending on the woman's graduation date. More

Table 7.1

Self-Reported Pregnancy by 6 Month Intervals

	Self-Reported Pregnancies	Number Responding to Questionnaire	Pregnancy Rate	Cumulative[a] Pregnancy Rate
6 Months After Recruit Training	39	371	10.5%	10.5%
12 Months After Recruit Training	39	262	14.9%	18.2 - 25.4%
18 Months After Recruit Training	20	88	22.7%	

[a] A simple additive estimate of the cumulative pregnancy rate assumes that the rate at 12 months is the sum of the rate between 0 and 6 months, and the rate between 6 and 12 months. A more conservative method of calculating the cumulative rate is (the number of women reporting pregnancies)/(total number of women who returned questionnaires at the 6 month and 12 month follow-ups). An estimate of the cumulative pregnancy rate at 18 months is not computed because of the small number of questionnaires returned at 18 months.

specifically, these data are complete through 18 months following recruit training for all series surveyed (n = 955); they are complete through 24 months for Series 19, 20, 21, 4004, 4012, and 4014 (n = 638); and through 30 months for those graduating in Series 19, 20, and 21 (n = 321).

As can be seen in Table 7.2, the pregnancy attrition rate in the first 12 months after recruit training is minimal (cumulative rate of 3.3%). However, the rate doubles between 12 and 18 months after recruit training (cumulative rate of 7.5%), and continues to rise through 30 months (estimated cumulative rate of 21.9%).

Can Pregnancy Be Predicted from Prior Attitudes and Behaviors?

A series of exploratory multivariate analyses of variance was conducted to identify attitudes and behaviors that could be used to predict which women Marines become pregnant during the first 18 months after recruit training. These analyses revealed that women who become pregnant are significantly different at recruit training from those who avoided pregnancy. The differences between these two groups of women can be characterized along two dimensions: (1) the attitudes about pregnancy the women held during recruit training, and (2) their attitudes about contraception and their contraceptive behavior prior to enlistment. Measures of these attitudes and behaviors were entered into a discriminant function analysis which confirmed that they reliably predict which women become pregnant (see Table 7.3):

(1) Attitudes toward pregnancy. Women Marines who became pregnant had more positive attitudes toward pregnancy during recruit training than did women Marines who did not become pregnant. More

Table 7.2

Pregnancy Attrition by 6 Month Intervals

	Series	Pregnancy Discharges	6 Month Rate	Cumulative Rate
6 Months After Recruit Training	all	9	.9%	0.9%
12 Months After Recruit Training	all	23	2.4%	3.3%
18 Months After Recruit Training	all	40	4.2%	7.5%
24 Months After Recruit Training	19, 20, 21 4004, 4012, 4014	38	6.0%	13.5%*
30 Months After Recruit Training	19, 20, 21	27	8.4%	21.9%*

* The cumulative attrition rates at 24 and 30 months are projections based on the series that were 24 and 30 months post-recruit training by July 1989.

Table 7.3

Differences Between Pregnant and Non-Pregnant Women Marines

Discriminant Function Analysis X^2 (df=9) = 33.10, $p < .01$

Univariate Tests Variable	Pregnant	Nonpregnant	Wilks' Lambda F
Perceived convenience of pregnancy (in next 12 months)[a]	5.91	6.14	.908*
Plans to get pregnant in next 3 years[b]	4.61	5.42	.928*
Estimated likelihood of pregnancy (in next 12 months)[c]	20.65	10.73	.960*
Typical failure rate of method of birth control used at last intercourse[d]	30.91	22.53	.946*
Knowledge of birth control[e]	18.66	19.12	.936*
Opinion of rhythm and withdrawal[f]	10.77	10.85	.912*
Intention to use rhythm and withdrawal[g]	10.67	11.39	.922*
Marital status (after recruit training)[h]	.19	.11	.940*
Previous pregnancy[i]	1.63	1.75	.929*

[a] Rating scale ranges from 1 "not at all inconvenient" to 7 = "extremely inconvenient."

Table 7.3 (continued)

[b] Rating scale ranges from 1 = "definitely plan to get pregnant" to 7 = "definitely do not plan to get pregnant."

[c] Rating scale ranges from 0 to 100.

[d] Scale ranges from 0 to 100 with numbers indicating the typical likelihood of pregnancy over 12 months.

[e] Scale ranges from 0-40; high scores indicate more knowledge.

[f] Scale ranges from 2 = "extremely effective" to 14 = "extremely ineffective."

[g] Scale ranges from 2 = "would definitely use" to 14 = "definitely would not use."

[h] Scale ranges from 0 to 1 with higher numbers indicating a greater proportion of women are married.

[i] Scale ranges from 1 to 2 with higher numbers indicating greater proportions have had a previous pregnancy.

* $p < .01$

specifically, during recruit training these women were significantly more likely to report that they thought that a pregnancy within the next 12 months would not be inconvenient, and were more likely to report that they were planning to get pregnant in the next 3 years. Women who later conceived were more likely than other recruits to report that they were likely to get pregnant during the coming year, and less likely to have previously experienced a pregnancy.

(2) Contraceptive behavior prior to entering recruit training. Pregnant women Marines were more likely to have a history of unprotected intercourse, and/or inadequate contraceptive protection prior to recruit training than were the women who did not get pregnant. Consistent with this history, they were less knowledgeable about contraception, more likely to rate rhythm and withdrawal as effective methods of birth control, and more likely to report intentions to use rhythm and withdrawal.

Marital status. Marriage after recruit training is also associated with pregnancy. The current data however, do not indicate whether marriage preceded pregnancy, or pregnancy preceded marriage. Thus we can not determine whether marriage is an antecedent of pregnancy.

Can Pregnancy Attrition Be Predicted From Prior Attitudes and Behaviors?

A series of exploratory multivariate analyses of variance was conducted to identify attitudes and behaviors which could be used to predict pregnancy attrition. These analyses revealed that women recruits who were later discharged because of pregnancy were

significantly different from other women at the end of recruit training. The discriminant function analysis summarized in Table 7.4 indicates that these differences can be characterized along 3 dimensions: (1) attitudes toward pregnancy, (2) attitudes about sex, and (3) attitudes toward specific methods of birth control.

(1) Attitudes toward pregnancy. In general, women who attrite because of pregnancy report more positive attitudes toward becoming pregnant within the first 12 months following recruit training, and more definite plans to get pregnant within the 3 years following recruit training than do other women recruits. However they also indicate significantly more ambivalence toward pregnancy within the 12 months following recruit training. (Ambivalence is defined as the difference in their perceptions that pregnancy would be inconvenient and their reports of how unhappy they would be if they were to become pregnant.)

(2) Attitudes toward sex. Women recruits who later attrite because of pregnancy have more negative attitudes toward sex than do women recruits who do not attrite because of pregnancy.

(3) Attitudes toward birth control. Women recruits who later attrite because of pregnancy rated moderately effective methods of contraception (i.e., sponges, foams, suppositories) as less effective than did other women recruits. They also indicated a greater likelihood that they would use two ineffective methods of birth control (rhythm and withdrawal) than did other women recruits.

Table 7.4

Differences Between Women who Attrite Because of Pregnancy and Other Women Marines

Discriminant Function Analysis X^2 (df=8) = 25.21, $p < .01$

Univariate Tests Variable	Pregnancy Attriters	Other Women Marines	Wilks' Lambda F
Happiness about the possibility of pregnancy in the next 12 months)[a]	3.93	4.69	.957*
Plans to get pregnant in next 3 years[b]	4.49	5.28	.972*
Estimated likelihood of pregnancy (in next 12 months)[c]	22.06	13.14	.978*
Ambivalence about pregnancy in next year[d]	1.75	1.65	.957*
Attitudes toward sex[e]	50.46	53.43	.964*
Opinion of foam, suppositories, and sponges[f]	12.56	12.16	.962*
Intention to use rhythm and withdrawal[g]	10.57	11.26	.966*
Previous pregnancy[h]	1.75	1.71	.959*

[a] Rating scale ranges from 1 = "not at all unhappy" to 7 = "extremely unhappy."

[b] Rating scale ranges from 1 = "definitely plan to get pregnant" to 7 = "definitely do not plan to get pregnant."

[c] Rating scale ranges from 0 to 100.

Table 7.4 (continued)

[d] Ambivalence is defined as the difference between perceived happiness about pregnancy and perceived inconvenience of pregnancy; higher numbers indicate greater ambivalence.

[e] Attitudes toward sex as measured by the Sexual Opinion Survey; lower numbers indicate less comfort with sexuality.

[f] Scale ranges from 3 = "extremely effective" to 21 = "not at all effective."

[g] Scale ranges from 2 = "would definitely use" to 14 = "definitely would not use."

[h] Scale ranges from 1 to 2 with higher numbers indicating a higher proportion of the women have had a previous pregnancy.

* $p < .01$

Summary and Discussion

The pregnancy rate for women Marines is significantly higher than the rate for other women of the same age (18 to 25% per year for women Marines vs. 10-11% per year for the general population; cf. Blum, 1987; Hayes, 1987). In addition, pregnant women Marines are significantly more likely to carry their pregnancies to term and keep their babies than are other pregnant women their age (the abortion rate for pregnant women age 18-24 is typically about 40% (Hayes, 1987; Tanfer & Horn, 1985) compared to the 20% reported in this sample).

The difference between those women Marines who get pregnant in the first 18 months after recruit training and those who do not is in large part a difference in knowledge, attitudes, and behavior patterns that the women bring with them into the Marine Corps. The best predictors of pregnancy in the first 18 months of service are lack of knowledge about birth control, positive attitudes toward pregnancy reported during recruit training, and ineffective contraceptive behaviors practiced prior to recruit training.

The findings reported in Chapter 5 indicate that women Marines do not become more knowledgeable about birth control after they leave recruit training, and they do become less effective contraceptors after they leave recruit training than they were prior to enlistment. It appears then, that the high pregnancy rate among first term women Marines results from a combination of factors: (a) the women who join the Marine Corps have a history of a high level of sexual activity and relatively ineffective contraceptive habits; (b) they become even more sexually active and their contraceptive behaviors become less

effective once they are in the Marines Corps; (c) they enter the Corps with relatively positive attitudes toward pregnancy; and (d) these attitudes toward pregnancy become more positive after recruit training. It appears that lack of motivation to avoid pregnancy, combined with the women's faith in, and intention to use relatively ineffective methods of birth control is responsible for their failure to use effective methods of birth control conscientiously and consistently. Given their relatively high level of sexual activity, the result is a relatively high level of pregnancy.

Pregnancy attrition is associated with a set of attitudes about sex, pregnancy, and birth control that is consistent with previous research on unplanned pregnancy. The women who attrite because of pregnancy are likely to be planning to get pregnant within three years after recruit training, but are ambivalent about pregnancy in the near future; they are experiencing some emotional conflict about their sexuality, and report positive attitudes about rhythm and withdrawal which are likely to increase their risk of pregnancy. It would appear then, that the high pregnancy attrition rate is a result of these women's conflict and ambivalence, and use of ineffective methods of birth control, rather than intentional attempts to get pregnant.

Chapter 8

DISCUSSION AND CONCLUSIONS

Summary of Findings

1. As a group, women Marines enter recruit training with a relatively large amount of sexual experience.

2. They have both the knowledge and the experience necessary to avoid unplanned pregnancy by practicing birth control, but often fail to put this knowledge to use.

3. Many women recruits are ambivalent about the possibility of pregnancy. On the one hand, most are aware that pregnancy early in their enlistments would be extremely inconvenient. On the other hand, almost one-third reported that they would not be entirely unhappy if they were to become pregnant during the 12 months following recruit training.

4. The first six months after recruit training is a period of considerable attitude change for women Marines. They become more family oriented, and their attitudes toward sex become more liberal.

5. The first six months after recruit training is also a period of increased vulnerability to unplanned pregnancy. There is an increase in the women's sexual activity, both in terms of their number of partners, and their frequency of intercourse. There is also a significant decrease in their use of effective methods of birth control.

6. By 12 months after recruit training there is a decrease in the number of sexual partners. However an increase in their frequency of intercourse, and the continuation of ineffective contraceptive

behavior keeps the risk of unplanned pregnancy high throughout the first 18 months after recruit training.

7. Between 18 and 25 percent of women Marines get pregnant in the first 12 months after recruit training. This relatively high pregnancy rate among first term women Marines is the result of a combination of factors: (a) the women engage in sexual intercourse frequently; (b) they do not use effective methods of contraception; and (c) their attitudes toward pregnancy are not negative enough to motivate conscientious and consistent use of their choosen methods of birth control.

8. Although women Marines know how to protect themselves from HIV infection few of them use condoms on a regular basis.

Discussion

Although young women in their late teens and early twenties are often ineffective and inconsistent contraceptors, women Marines appear to be less effective than both college and noncollege women their age (for comparison with noncollege women see Tanfer & Horn, 1985). When this less effective birth control behavior is combined with their higher than average rate of sexual intercourse, it is not surprising that the result is a relatively high pregnancy rate.

What is more interesting, however, is that these women's sexual activity increases and their use of effective contraceptive methods decreases significantly following recruit training. The current data indicate that during the 18 months following recruit training, these women do not practice birth control as effectively as they did prior to recruit training.

Changes in attitudes. The current study indicates that low motivation to avoid pregnancy is partially responsible for this shift toward less effective birth control -- many of the women were ambivalent about pregnancy at the end of recruit training, and became significantly more positive about it (and therefore less motivated to avoid it) following recruit training.

As was described in Chapter 1, being an effective contraceptor requires: (1) an awareness that unprotected sexual intercourse can result in pregnancy, (2) knowledge that pregnancy can be prevented by the use of birth control methods, (3) acquisition of the information, contraceptive devices and/or medication necessary to avoid pregnancy, and (4) consistent and effective use of the information and/or devices. The current data suggest that the majority of women Marines have successfully negotiated steps 1 and 2 of this sequence prior to entering the Corps. The data also clearly indicate that steps 3 and 4 present a problem for many women Marines during the first 18 months after recruit training. There are several potential obstacles to acquiring and using effective methods of birth control (e.g., cost, inaccessability, pressure from sexual partners) that were not addressed in the current study. The data do however, suggest that women who are ambivalent toward pregnancy or lack strong enough motivation to avoid pregnancy will have difficulty completing steps 3 and 4.

Unplanned versus Planned Pregnancy

Any discussion of pregnancy in the Marine Corps would be incomplete without mention of the possibility that women Marines who

become pregnant do so intentionally. The current data do indicate that some women Marine's pregnancies are planned, some are accidental, and some are the result of ambivalence about pregnancy or conflict over sexual behavior. It is impossible, however, to determine what percent of the women fall into each of these three categories. It is clear though, that the majority of pregnancies among first term women Marines fit the definition of unplanned pregnancy -- they are pregnancies which were not intended at the time of conception. In other words, ambivalence about pregnancy and conflict over sexual behavior may inhibit women from taking steps 3 and 4 outlined above, and thus result in some pregnancies that were not intended, but were not entirely unwanted. Many of these women may not have sufficient motivation to consistently take oral contraceptive pills in order to avoid pregnancy, but if they had to take a pill <u>in order to get pregnant</u>, they would not do so.

<u>Can the Pregnancy Rate Be Decreased?</u>

The best predictors of pregnancy among first term women Marines are the contraceptive knowledge and habits they brought with them into the Corps and their attitudes toward pregnancy. Women Marines tend to be ineffective contraceptors prior to entering the Corps and become even <u>less</u> effective during the first 18 months after recruit training. The results of this study suggest two ways to reduce the pregnancy rate among first term women Marines: (1) recruiting women who are less traditional in terms of their plans for motherhood and therefore more motivated to delay or avoid pregnancy (this option was suggested by

Kerce and Royle in a previous study of pregnancy in the Marine Corps); and (2) changing the attitudes and behaviors of the women who are recruited.

Programs designed to change attitudes and behaviors relevant to pregnancy typically fall into three major categories. The first consists of programs designed to educate or inform. The second consists of programs aimed at increasing the availability of contraceptive counseling and services. And the third consists of programs aimed at increasing motivation to avoid pregnancy (Hayes, 1987). In this section, I will address the advisability of each of these approaches given what we now know about the sexual behavior and contraceptive practices of women Marines.

Educational programs. Educational approaches to reducing unplanned pregnancy are based on one of the following assumptions: the problem results from a lack of knowledge about conception, and/or contraception, or there is a deficit in the social skills necessary to negotiate effective contraceptive behavior with sexual partners.

The current data suggest that women enter the Marine Corps with specific deficits in their knowledge that may make them vulnerable to pregnancy (e.g., between 1/3 and 1/2 do not know the time of month when they are fertile). However, because they also have attitudes which inhibit effective contraception, educational programs designed solely to increase the women's knowledge about contraception is likely to have little impact on their contraceptive behavior.

It is more likely that a program that addresses specific deficits in knowledge, and teaches the women where to acquire

contraceptives, how to use them, and the social skills necessary to negotiate contraceptive use with their sexual partners will reduce the rate of unplanned pregnancy. Such a program could address sexual problem solving, decision making regarding sex and contraception, and interpersonal communication skills in intimate relationships. This kind of program could use modeling, role playing, and rehearsal to help the women learn how to put their knowledge of birth control into effect, and to encourage them to be more diligent in their use of birth control (cf. Royle, Molof, Winchell, & Gerrard, 1986).

Such a program would be most successful if it were to occur when the women are first exposed to the situations in which they need the skills. This kind of program would be unlikely to succeed if delivered during recruit training because the women in recruit training are not coping with sexual decisions. The sexual activity rates of the women in the current study suggest that the program is needed during the first six months after recruit training.

Increasing accessibility. Given that the vast majority of women Marines have used effective methods of birth control at some time prior to recruit training (at least 75% have used oral contraceptive pills, diaphragms or condoms), and the fact that use of these methods decreases dramatically after recruit training, it is possible that inaccessibility of confidential and/or affordable contraceptive services is part of the problem.

Research on programs designed to prevent unplanned pregnancies by increasing the availability of contraceptive services has indicated that there are several factors that increase the effectiveness of

these programs. Primary among these are: (a) outreach and advertising to let women know that the services are available, (b) convenient locations and hours so that the women can take advantage of the services, and (c) the provision of counseling, physical examinations and prescriptions in one location. An additional program element worthy of mention is the "hot line" program. This service allows women to anonymously obtain accurate information about birth control, sexually transmitted diseases, and the availability of services. It can be a relatively low cost adjunct to clinic services, as well as an excellent advertisement for services, and will often serve as the woman's first contact point with the broader variety of services.

Motivational programs. Educational programs and increased accessibility to services can be very effective in decreasing the pregnancy rate among women who are motivated to avoid pregnancy. They may, however, have minimal impact on women who are ambivalent about pregnancy. A variety of programs have been designed to enhance young women's self-esteem and their sense of control over their lives, thereby increasing their motivation to avoid or delay pregnancy. These programs are generally aimed at clarifying life goals and instilling an appreciation of how early childbearing would affect one's ability to achieve those goals.

An excellent example of this kind of program has already been implemented at the Marine Corps Communications Electronics School, Marine Corps Air Ground Combat Center at Twenty-nine Palms -- the Lady

Leatherneck Program. A number of the stated goals of this program are very similar to those of similar civilian programs:

> - To build morale among women Marines by providing them a distinct positive identity, with the aim of making them better students and more productive Marines.
> - To provide additional training in self-esteem, role playing, decision making, leadership, values, maintaining femininity, etc.
> - To provide incoming women Marines with an initial point of contact in receiving [sic] through a trained Group Leader Support program designed around a "Big Sister" theme.
> - To create and foster a positive image in women Marines' of themselves.
> - To provide a non-hostile environment in which a woman Marine can express the woman Marine's viewpoint of Marine service, individual concern and individual experience (Kelley, 1989).

The preliminary data on this program indicate that it has been successful not only in reducing the pregnancy rate (from 17% per year to less than 1% per year), but that it also has reduced disciplinary discharges.

Vulnerability to AIDS

First term women Marines do not take initiative in protecting themselves from infection with HIV. While this is not uncommon for young women their age, their higher levels of sexual activity and larger number of partners suggests that they are at greater risk of contracting the disease through sexual intercourse than the average woman their age.

Illusion of invulnerability. It is typical for healthy young men and women to believe that their bodies are invincible. Thus, the illusion of invulnerability to HIV displayed by these women Marines is typical for women their age. Their relative lack of preventive behavior is also typical (see Kegeles et al., 1988; Price et al.,

1985). These perceptions, however, may be more intractable among military personnel than among other segments of the population because they are re-enforced by the regular HIV testing program. The testing program may give military personnel a false sense of security in two ways: they may conclude that if they have tested negative for the virus in the past, their current sexual behavior is not putting them at risk, and they may conclude that sexual partners who are also in the military do not represent a risk because they have passed the tests.

Until this illusion is broken and women Marines begin to assume more responsibility for their own protection, their chances of contracting the virus are entirely determined by whether their sexual partners are infected. The goal must be to try to break through this illusion of invulnerability and teach the women to assume more responsibility for protecting themselves (i.e., buying condoms and insisting that their male partners use the condoms).

Conclusions

A number of areas of further study are suggested by the current investigation.

Differences in pregnancy rates related to month of recruitment. The differences in the sexual and contraceptive behaviors of women in different recruit training series suggests the possibility that women recruited at certain times of the year are more prone to pregnancy and pregnancy attrition than those recruited at other times of the year. Examination of these differences across only one year however, does not permit generalizing to other years. It is recommended that

pregnancy and pregnancy attrition data from several years be analyzed to determine if there is a relationship between month of recruitment and pregnancy.

Accessibility of confidential contraceptive counseling and services. One possible explanation of the finding that women Marines become less effective contraceptors after recruit training than they were before entering the Marine Corps is that they do not have access (or do not perceive that they have access) to a broad range of confidential contraceptive services. It is recommended that the actual and perceived accessibility of services be studied.

Male Marines' sexual and contraceptive knowledge, attitudes and behavior. The current study provides information concerning the sexual and contraceptive attitudes, knowledge and behavior of women Marines. It does not, however, provide information about the attitudes, knowledge and behavior of the men who are most likely to be these women's sexual partners -- male Marines. Information similar to that collected in this study, but on the sexual attitudes, knowledge, and behaviors of male Marines could be very valuable in planning intervention programs.

The Lady Leatherneck Program. Preliminary data from the Lady Leatherneck Program indicate that it has been successful in increasing women Marine's motivation to avoid pregnancy and has reduced the pregnancy rate among its participants. It is recommended that this program undergo a formal evaluation in order to determine its effectiveness in reducing unplanned pregnancy, and to determine which elements of the program can be replicated at other locations.

Footnotes

[1] A recent analysis of pregnancy attrition data at Headquarters U. S. Marine Corps revealed a pregnancy attrition rate of 17% by the 43rd month of service (Curry, 1989).

[2] The formula for estimating pregnancy rates from sexual and contraceptive behaviors is discussed in chapter 3.

[3] An unplanned pregnancy is defined as a pregnancy that was unintended at the time of conception. It should be recognized that a woman's attitude about a pregnancy often changes over the course of the pregnancy.

[4] Due to the difficulty in tracking college women, and the ample existing literature on them, the college student comparison group was surveyed only one time. Analyses comparing the women Marine's and the college women's responses used only the initial survey responses of the women Marines (the data collected at Parris Island).

[5] The response rate for any given series at any given follow-up was the number of responders (R) divided by the number initially surveyed at Parris Island (I) minus the number of "unreachable" participants (U) minus the number of women who had attrited (A) or R/(S-U-A).

[6] Typical failure rates for specific methods of birth control are the percent of women that would be expected to get pregnant over the course of one year using the method (Hatcher, et al., 1986). These failure rates include both method failures and user failures.

[7] It should be noted that the lower level of sexual activity among the Hispanic women decreases the projected pregnancy rate for this group as a whole to 23%.

[8] The 21 percent estimate is a conservative estimate based on the assumption that women who were virgins during recruit training will not get pregnant in the first year after recruit training. The 25 percent estimate is based on the assumption that these women will become sexually active and that their contraceptive use will be comparable to that of the women who are already sexually experienced.

[9] There were two differences between the survey completed by the women Marines and that completed by the college women: a) Because it was assumed that the women Marines were not engaging in sexual intercourse during recruit training, they were asked about the frequency of sexual intercourse during the three months prior to recruit training. The college women were asked about their frequency of intercourse during the three months immediately prior to completion of the questionnaire; and b) The questions designed to assess perceived vulnerability to pregnancy and HIV infection asked the women Marines to compare their risk to that of other women Marines, whereas these questions asked the college women to compare their risk to that of other college women.

[10] The average age of the college women was not significantly different than that of the women Marines (18.4 vs. 19.5). However we used age as a covariate in all of the comparisons between the two samples in order to remove this source of variance.

[11] As was discussed in Chapter 3, the distribution of the women Marines' responses to the question "How unhappy would you be if you were to become pregnant in the next year?" was dichotomous. That is, a sizable minority of the women Marines indicated that they would "not be unhappy" (31% responded with ratings lower than 4 on a scale where 1 = "not at all unhappy" and 7 = "extremely unhappy". In contrast, the distribution of the college women's responses was very skewed toward the "unhappy" end of the scale (86% indicated that they would be "extremely unhappy", and only 8% responded with ratings lower than 4).

[12] It should be noted that the small number of sexually active Hispanic women in the Marine sample (n = 42) increases the possibility of a Type II statistical error relative to statistical tests performed on the White and Black women Marines' data.

[13] Some of the means for the data collected at recruit training are different than those reported in Chapter 3. The means reported previously for data collected at recruit training included all women surveyed at Parris Island (N = 956). The number of women in the analyses reported in this chapter vary from comparison to comparison. For example, comparisons of recruit training responses and responses to the 6 month follow-up resulted from analysis of the responses of the 376 women who completed the survey both during recruit training and 6 months later. Likewise, comparisons of attitudes and behaviors at 6 months after recruit training and 12 months after recruit training resulted from analysis of the responses of the 164 women who responded to the 6 month follow-up and the 12 month follow-up. While the mean scores may vary depending on the subset of women used in a

specific analysis, the trends reported are the same regardless of which subset of women were included in the analyses.

[14] The data at 18 months represent responses from only 65 sexually active women.

[15] Women Marines are less likely than college women to report regular use of condoms. Thus their relatively infrequent use of condoms, and their relatively frequent sexual activity, suggest that women Marines are at greater risk of sexual transmission of HIV than are college women.

[16] A simple additive estimate of the cumulative pregnancy rate assumes that the rate at 12 months is the sum of the rate between 0 and 6 months, and the rate between 6 and 12 months. A more conservative method of calculating the cumulative rate is computed as (the number of women reporting pregnancies) / (the total number of women who returned questionnaire at the 6 month and 12 month follow-ups) or (39 + 39)/(305 + 235 - 111) = 18.2%) where 111 is the number of women who returned questionnaires at both 6 and 12 months. For the purposes of this report, the cumulative pregnancy rate is reported as a range between this conservative method of estimation and a simple additive estimate.

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